Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Advanced Television Systems	)	
and Their Impact Upon the	)	MM Docket No. 87-268
Existing Television Broadcast	)	
Service	)	

HITACHI AMERICA, LTD. COMMENTS ON THE FOURTH FURTHER NOTICE OF PROPOSED RULE MAKING AND THIRD NOTICE OF INQUIRY

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I. INTRODUCTION

Hitachi America, Ltd. (HAL) files the following comments in response to the Commission's Fourth Further Notice of Proposed Rule Making and Third Notice of Inquiry released on August 9, 1995 in the above-referenced proceeding.

A. The FCC Process

Hitachi America, Ltd. (HAL) commends the Commission for fostering and guiding an ATV selection process that has included diverse social and policy issues as well as thorough technical analysis and testing. HAL encourages the Commission in its implementation of the ATV standard that has resulted from the Commission's continuing efforts. HAL believes that the Grand Alliance system offers world leadership in technology and in flexibility that permits diverse new public services.

B. Hitachi America, Ltd.

Hitachi America, Ltd. (HAL), with its North American subsidiaries, is a leading manufacturer of large-screen projection televisions, as well as VCRs, audio products, and other consumer devices related to the matter of this Advanced Television (ATV) proceeding. HAL has been deeply involved in the activities of the Commission's Advisory Committee on Advanced Television Service (ACATS) since its formation. Members of HAL's technical staff have chaired groups within the ACATS responsible for some specialized aspects of digital system testing, for analyzing the results of the transmission-related portions of the testing, for recommending the modulation format, and for documenting the video encoding system as part of ATSC's activities. HAL is acutely interested in these proceedings and files these comments from a perspective of deep involvement in the U.S. ATV selection process.

HAL has worked with the ATV Committee of the Electronic Industries Association (EIA) in formulating the Comments being filed by that committee on behalf of the industry. HAL offers these additional comments to stress points that HAL feels are critical and where HAL feels it has unique expertise.

HAL has also made technical contributions that support some of the policy questions raised in this proceeding. HAL has provided public demonstrations of its "All-Format Decoder" (AFD) technology that makes possible reception of a High Definition Television (HDTV) signal at a cost only slightly higher than that for Standard Definition Television (SDTV) signals. This AFD technology makes possible HDTV receivers at a variety of price points, offers policy flexibility in the introduction of digital television service, and provides the means for low-cost converters so that NTSC receivers also can be used to view the digital television signals.

II. COMMENTS ON ISSUES RAISED IN THE FOURTH NOTICE OF PROPOSED RULE MAKING

A. All-Channel Receiver Issues (paragraphs 77 and 78)

Hitachi America, Ltd. (HAL) agrees that the All-Channel Receiver Act provides the framework under which ATV receivers could be required to decode and display all television signals, whether NTSC, SDTV, or HDTV. HAL believes that the display format and resolution choices should be market-driven, meaning, for example, that a receiver priced and purchased as "SDTV" should be expected to display an HDTV transmission in SDTV resolution. This will result in a variety of receiver price points, with image quality ranging from that of the best of today's NTSC reception up to images with full HDTV quality. HAL believes that all ATV receivers should be capable of decoding all

transmitted signals, regardless of whether those transmitted signals are NTSC, SDTV, or HDTV.

HAL notes that the price of NTSC decoding is so low, at least on the scale of ATV decoding, that it is entirely reasonable to expect all ATV receivers to decode NTSC signals. This same understanding of the relative prices, however, makes it unwise to expect receivers sold as "NTSC" to be able to decode ATV signals. Therefore, HAL recommends that ATV receivers be expected to decode HDTV, SDTV, and NTSC signals; NTSC receivers need decode only NTSC signals. HAL recognizes that this approach places some burden on the consumer to make an informed decision about the utility of an NTSC receiver purchase during a time of transition to ATV.

In order for consumers to make wise decisions, it behooves the Commission to establish a timetable for the transition to ATV and to promote and enforce that timetable vigorously. The fact of a credible timetable is more important than the exact dates specified, and HAL defers comment on the choice of date certain when NTSC broadcasts will cease. HAL notes, however, that a firm timetable can include review periods to measure progress against such milestones as the number of stations transmitting digital signals and the number of households with digital receivers. Digital households would include those with digital receivers or digital set-top-boxes for terrestrial, cable, satellite, or telco signals.

HAL believes that an "all-format" receiver requirement is more urgent if broadcasters have no requirement for HDTV transmission. If ATV service is permitted to be SDTV-only at the beginning and if receivers with only SDTV capability gain significant market share, then a future change to include HDTV becomes difficult. In such a scenario, there will be too many relatively new SDTV-only receivers that would not be able to decode the

HDTV image. An early de-facto preclusion of HDTV, without the opportunity for development of new programming and new services that take advantage of HDTV's potential, would be a disservice to the viewing public, to new businesses that will develop taking advantage of HDTV, to consumer manufacturers developing new products, and to broadcasters who will be unable to compete in image quality with alternative delivery means. An alternative to a mandate for "all-format" receivers would be a requirement that broadcasting include a reasonable mix of HDTV and SDTV programming from the outset. Either regulatory approach -- mandatory all-format receivers or mandatory broadcasting of at least a meaningful minimum of HDTV programming *ab initio* -- can serve the need for preservation of the HDTV option.

HAL notes further that the same technology that permits low-cost decoding of HDTV signals also makes possible an affordable converter box for owners of otherwise-useless NTSC receivers in a new world of ATV transmissions. The existence of low-cost converter boxes has been an assumption of the Commission's strategy for transition away from NTSC. HAL supports the statements in the Notice expressing confidence in such converter technology; HAL believes that its own public demonstrations of suitable technology reinforce the point.

As the Notice asserts, it is reasonable to expect the cost of all-format receivers to be very close to the cost of SDTV-only receivers as long as the display resolutions are at the SDTV level. It may be useful to put this cost into perspective. A dominant cost of the HDTV video decoding function is memory (DRAM). An SDTV or all-format receiver requires one-sixth the memory of an HDTV decoder. The all-format receiver uses exactly the same memory as an SDTV-only receiver. The video decoding logic of the all-format receiver is about 20% more logic gates than an SDTV-only receiver; HAL estimates that HDTV decoding logic is bigger than SDTV logic by about a factor of four.

It may also be useful to put these costs into the perspective of the total signal processing circuitry costs of an SDTV receiver. HAL estimates that almost half of the total signal processing costs of an SDTV receiver are attributable to the video decoding circuits and their associated memory. The rest of the signal processing costs include tuning, demodulation, error correction, audio, and signal de-multiplexing.

When the cost situation is considered from the viewpoint of a complete HDTV receiver, HAL believes that the cost of an HDTV display will greatly exceed the cost of HDTV signal processing circuitry for the foreseeable future. However, it is also true that, at least for the next few years, the cost of HDTV signal processing circuitry will exceed the cost of an SDTV display. This is the reason that "all-format" receiver technology is an essential part of an ATV service development scenario.

B. Transition (paragraphs 38, 53)

Hitachi America, Ltd. (HAL) believes that a simulcast requirement is unnecessary and unwise. In the early years of the transition, simulcast will be the norm, with or without a requirement. HAL suggests that the existence of low-cost set-top-boxes based on all-format receiver technology such as discussed above, will shorten any transition scenario and lessen reliance on simulcasting, particularly in the later years of the transition. Low-cost all-format decoders can make all programming available on all new or existing receivers. HAL also believes that the relative cost of NTSC decoding, compared with any form of ATV decoding, makes NTSC decoding capability a reasonable expectation of all ATV receivers. Therefore, a simulcasting requirement is not needed to lower ATV receiver cost. Additionally, HAL believes that a simulcast requirement in the later years of the transition might actually retard the completion of the transition.

III. CONCLUSION

Hitachi America, Ltd. (HAL) believes that the technology for implementation of digital ATV is in place. HAL believes that receivers that address the full range of consumer price and performance needs -- including NTSC, SDTV, and HDTV -- can be designed. HAL believes that all-format decoder technology should hasten the transition from analog to digital broadcast television. HAL notes that the Grand Alliance system provides flexibility for new digital services. New products that take advantage of this new flexibility, plus the familiar family of such television products as receivers, VCRs, and camcorders, await the adoption of a standard. The Commission is encouraged to complete its standard-setting process and hasten the availability to consumers of these new digital television and information services.

Respectfully submitted,

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